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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,203	12/31/2003	Bin Li	I-2-0482.1US	9186

24374 7590 10/10/2006

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EXAMINER	
AHN, SAM K	

ART UNIT	PAPER NUMBER
2611	

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/750,203	LI ET AL.	
	Examiner	Art Unit	
	Sam K. Ahn	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because the abstract *must be in a single paragraph, and should not exceed 150 words.* Correction is required. See MPEP § 608.01(b).

Claim Objections

2. Claims 1-14 are objected to because of the following informalities:

In claim 1,line 1, define "M-QAM", line 10, "value;" should be "value; and".

In claim 2, line 3, "transmitting symbol" should be "transmitted symbol".

In claim 3, line 1, define "q-ASK", line 4, define "N", line 10, "sum;" should be "sum; and ".

In claim 4, line 11, ";" should be "; and".

In claim 5, line 1, define "M-QAM".

In claim 6, line 1, define "q-ASK".

In claim 7, line 1, define "M-QAM".

In claim 8, line 1, define "M-QAM".

In claim 9, line 1, define "M-QAM", line 12, define "σ^2_n".

In claim 10, line 1, define "q-ASK".

In claim 11, line 1, define "q-ASK", line 7, "$E(r_k)^2$" should be "$E(r_k^2)$", "$E(r_k)^4$" should be "$E(r_k^4)$", "$E(d_k)^2$" should be "$E(d_k^2)$", and "$E(d_k)^4$" should be "$E(d_k^4)$".

In claim 12, line 1, define "q-ASK", line 7, "$E(r_k)^2$" should be "$E(r_k^2)$", "$E(r_k)^4$" should be "$E(r_k^4)$", "$E(d_k)^2$" should be "$E(d_k^2)$", and "$E(d_k)^4$" should be "$E(d_k^4)$", and in line 9, "$E(r_k)^2$" should be "$E(r_k^2)$", "$E(d_k)^2$" should be "$E(d_k^2)$".

In claim 13, line 1, define "q-ASK", line 7, "$E(r_k)^2$" should be "$E(r_k^2)$", "$E(r_k)^4$" should be "$E(r_k^4)$", "$E(d_k)^2$" should be "$E(d_k^2)$", and "$E(d_k)^4$" should be "$E(d_k^4)$", line 9, "$E(d_k)^2$" should be "$E(d_k^2)$", and define "σ^2_n".

In claim 14, lines 1 and 2, define " M-QAM" and "q-ASK", line 12, "Kurtosis component able" should be "Kurtosis attributable", as described in the specification on paragraph 0049, line 13, ";" should be "; and". Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 1, the compliance of the claimed invention with the subject matter eligibility requirement of 35 U.S.C. 101 has been determined by the following analysis.

The claimed invention does fall within an enumerated statutory category claiming a method or a process. The claimed invention also fall with a 101 judicial exception claiming an algorithm or an abstract idea of performing calculations to

determine an amplitude of a signal, and the claimed invention covers a 101 judicial exception or practical application of the judicial exception.

However, treating the claim as a whole, the claim does not have any practical application by physical transformation, and further, does not produce a useful, tangible and concrete result. The claimed "to generate an estimated amplitude for the M-QAM signal" does not constitute as a physical transformation or produce useful, tangible result, since claim 1 as a whole stops at dividing step. It merely produces a value (number) and does not apply or use the number for any purpose as claimed. Therefore, the claim merely recites an algorithm directed to a non-statutory subject matter.

Claims 3,4 and 7-14 are rejected as applied to claim 1 above with the same analysis, wherein claims 2,5 and 6 directly depend on claim 1 or 4.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kenney et al. US 2004/0264589 A1 and US 2004/0264590 A1 teach demodulating QAM signal by estimating an amplitude of a signal constellation of the QAM signal.

Malm et al. US 2004/0264591 teach detection of M-QAM signal by estimating M-QAM symbol constellation decision boundaries.

Tarokh et al. Construction of OFDM M-QAM Sequences with Low Peak-to-Average Power Ratio, January 2003, IEEE, Vol.51, No.1, p.25-28 teach derivation of M-QAM signal from QPSK constellation with low peak-to-average envelope power ratios.

Tang et al. Effect of Channel Estimation Error on M-QAM BER Performance in Rayleigh Fading, December 1999, IEEE, vol.47, No.12, p.1856-1864, teach determination of BER of M-QAM in flat Rayleigh fading with imperfect channel estimates.

Kalet et al. QAM Transmission Through a Companding Channel – Signal Constellations and Detection, April 1994, IEEE, Vol.42, No.2/3/4, p.417-429, teach proper design of signal constellation and receiver structure for QAM signal over companding channels.

Zook et al. Adaptive Wireless Communication Signaling Algorithms for Differential Amplitude Phase Shift keying in Fading Channels, 2001, IEEE, p.118-122 teach an algorithm to maximize data rate for amplitude shift keying modulation signals.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sam K. Ahn
Patent Examiner

10/2/06